REMARKS:

INTRODUCTION

In the Office Action mailed May 1, 2006, the Examiner noted that claims 1, 3, 5, 6, 8 and 10 were pending and rejected claims 1, 3, 5, 6, 8, and 10. No claims have been amended. Claims 2, 4, 7, 9, 11 and 12 remain cancelled and new claim 13 has been added. Thus, in view of the forgoing, claims 1, 3, 5, 6, 8, 10 and 13 remain pending for reconsideration which is requested.

No new matter is being presented, and approval and entry of the claims are respectfully requested. The Examiner's rejections are traversed below.

REJECTION UNDER 35 U.S.C. §103(a)

In the Office Action at page 2, item 3, rejected claims 1, 3, 5, 6, 8, and 10 as being unpatentable over Pott (U.S. Pat. No. 6,164,064) (hereinafter Pott) in view of Hirota et al. (U.S. Pat. No. 6,233,925) (hereinafter Hirota). This rejection is respectfully traversed and reconsideration is requested.

Claim 1

Claim 1 recites:

> An exhaust gas purifying system provided with a NO_x occlusion reduction type catalyst having a catalyst metal and a NO_x occluding substance, in an exhaust passage of a diesel engine, and a control unit comprising a normal control operation means, a regeneration control initiation judging means for detecting a regeneration control initiation timing for said NO_x occlusion reduction type catalyst, a rich-burn control operation means for executing a rich-burn control operation for generating an exhaust gas which is in a fuel-rich state, accompanying recirculation of EGR gas, and a catalyst activation control operation means for executing a control operation for activating said catalyst metal immediately before said rich-burn control operation is performed;
>
> wherein said catalyst activation control operation means executing a burning control operation in the vicinity of the stoichiometric air/fuel ratio in a range of 0.8 to 1.1 in terms of an excess air factor, in the condition of an EGR valve being totally closed, and at the same time, executing a multi-stage injection and an early injection in the fuel injection into cylinders and controlling the torque generation of the diesel engine by an intake control to

reduce the torque variation during the transition from the normal control operation to the catalyst activation control operation.

The Office Action referred to Figs. 1 and 3, reference numeral 3, in Pott as describing "an exhaust gas purification system ... provided with a NO_x occlusion reduction type catalyst." Applicant respectfully submits that Pott is directed toward desulfurization of NO_x reservoir catalysts, and that reference numeral 3 refers to a NO_x reservoir catalyst. *See* Col. 2, lines 59-60. Nowhere in Pott is taught or suggested "a NO_x occlusion reduction type catalyst." The Office Action on Page 4, concedes that Pott fails to disclose that the NO_x occlusion reduction type catalyst has a catalyst metal and a NO_x occluding substance. Thus, Applicant respectfully submits that Pott fails to teach or suggest the use of the specific NO_x occlusion reduction type catalyst recited in claim 1.

Pott is concerned with removing sulfur from NO_x reservoir catalysts, where sulfur inhibits the absorption of NO_x by the reservoir catalysts. *See* Col. 1, lines 10-21. Claim 1 is directed towards an "exhaust gas purifying system" featuring "a regeneration control initiation judging means" for a specific type of catalyst, a NO_x occlusion reduction type catalyst. Applicant respectfully submits that NO_x occlusion reduction type catalysts require regeneration after a time when the catalyst has been changed into its nitrate form as a result of purifying the exhaust gas by removing NO_x. *See* Paras. [0008]-[0016]. Applicant respectfully submits that a system of purifying exhaust gas featuring at least "a regeneration control initiation judging means " for regenerating a NO_x occlusion reduction type catalyst is entirely different from a method and system of removing sulfur from a catalyst, and thus claim 1 is patentably distinguishable from Pott.

Second, the Office Action on page 3 cited col. 4, lines 1-7 of Pott to disclose, "the catalyst activation control operation means executes a burning control in the vicinity of the stoichiometric air-fuel ratio in the condition of an EGR valve being totally closed. . ." (page 3). Applicant respectfully submits that in the passage of Pott cited in the Office Action, "changing the EGR rate" does not disclose or contemplate that an EGR valve is fully closed during a catalyst control operation.

Third, the Office Action cited to col. 3, line 60 – col. 4 line 7 of Pott to teach or describe "controlling the torque generation of the diesel engine by an intake control to reduce the torque variation during the transition from the normal control operation to the catalyst activation control operation." Applicant respectfully submits that nowhere in the cited passage of Pott is it taught or suggested that the torque generation of the engine is controlled by an intake control to reduce

the torque variation during the transition of the catalyst activation control operation means from normal control operation to catalyst activation operation. The passage of Pott cited in the Office Action is directed toward a process for desulfurization of a Diesel engine, including a NO_x regeneration and a catalyst temperature-raising procedure. However, nowhere in the passage of Pott cited in the Office Action is the claim 1 feature of "controlling torque generation of the diesel engine by an intake control to reduce the torque variation," taught or described. Applicant respectfully submits that although the passage of Pott cited at col. 3, lines 60-64 contains "In the case of Diesel engines, desulfurizing cannot be carried out in the same way as for lean Otto engines since operation at $\lambda \leq 1$ for any length of time is not possible because it reduces power," nowhere in Pott is stated that the desulfurization process described includes controlling of torque generation of the engine to reduce torque variation.

Additionally, Applicant respectfully submits that Hirota fails to cure the deficiencies of Pott. The Office Action on page 3 cited Hirota at col. 4, lines 39-64 as teaching that it is conventional in the art for a NO_x occlusion reduction type catalyst to have a catalyst metal and a NO_x occluding substance. The Office Action contended that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the NO_x occlusion reduction type catalyst taught by Hirota in the system and method of Pott. Applicant respectfully submits that even if the teachings of Hirota and Pott were combined, the combination would fail to teach or describe all of the features of claim 1. Pott is directed toward removing sulfur from a catalyst, and even if that catalyst was a NO_x occlusion reduction type catalyst, Pott still fails to teach or describe the regeneration of a NO_x occlusion reduction type catalyst after such a catalyst has been reduced to its nitrate form as a result of its NO_x occlusion properties.

Thus for the aforementioned reasons, Applicant respectfully submits that neither Pott nor Hirota whether taken alone or in combination, teach or suggest all of the features of claim 1. Favorable reconsideration and a withdrawal of the rejection against claim 1 is respectfully requested.

Claim 6

Claim 6 recites:

> A method of exhaust gas purification to be carried out with use of an exhaust gas purifying system with a NO_x occlusion reduction type catalyst having a catalyst metal and a NO_x occluding substance, in an exhaust passage of a diesel engine, and a control unit comprising a normal control operation means, a regeneration control initiation judging means for detecting a

> regeneration control initiation timing for said NO_x occlusion reduction type catalyst, a rich-burn control operation means for executing a control operation for generating an exhaust gas which is in a fuel-rich state, accompanying recirculation of exhaust gas, and a catalyst activation control operation means for executing a control operation for activating said catalyst metal immediately before said rich-burn operation is performed, and performing a catalyst activation control operation by said catalyst activation control operation means when it is judged by said regeneration control initiation judging means that a regeneration control for the regeneration of the NO_x occlusion reduction type catalyst is to be initiated and thereafter executing a rich-burn control operation accompanying a recirculation of EGR gas by said rich-burn control operation means to thereby regenerate said NO_x occlusion reduction type catalyst, wherein in the course of said catalyst activation control operation, a burning control operation in the vicinity of the stoichiometric air/fuel ratio in the range of 0.8 to 1.1 in terms of an excess fuel factor is performed in the condition of the EGR valve being totally closed, and at the same time, a multi-stage injection and an early injection is executed in the fuel injection into cylinders and the torque control of the torque generation of the diesel engine by an intake control to reduce the torque variation during the transition from the normal control operation to the catalyst activation control operation, is executed.

Thus, Applicant also respectfully submits that neither Pott nor Hirota whether taken alone or in combination teach or suggest all of the features of claim 6. Favorable reconsideration and a withdrawal of the rejection against claim 6 is respectfully requested.

Claims 5 and 10

Claims 5 and 10 recite *inter alia*:

> controls the torque generation of the diesel engine by an intake control of the diesel engine to reduce the torque variation during the transition from catalyst activation control operation to the rich-burn control operation or from the rich-burn control operation to the normal control operation.

At page 5, the Office Action cited to col. 4, lines 17-25 of Pott to describe the above feature. Applicant respectfully requests that nowhere in this citation is taught or described anything about torque generation being controlled to reduce torque variation. The Office Action also cited to col. 3, line 60 – col. 4 line 7 of Pott as describing the above feature. The Applicant respectfully submits, as aforementioned, that Pott does not teach or suggest reducing or controlling torque. Applicant also respectfully submits that Hirota fails to cure the deficiencies of Pott. Thus, claims 5 and 10 are patentably distinguishable over the cited art. Favorable

reconsideration and a withdrawal of the rejection against claims 5 and 10 are respectfully requested.

Claims 3 and 8

Claims 3 and 8 depend directly from claims 1 and 6, respectively, and include all of the features of that claim plus additional features, which distinguish over the prior art. Therefore, Applicant respectfully submits that claims 3 and 8 are patently distinguishable over the prior art.

New Claim 13

New independent claim 13 recites:

> A method for purifying exhaust gas provided with a NO_x occlusion reduction type catalyst in an exhaust passage of a diesel engine, comprising:
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> executing a normal control operation;
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> detecting a regeneration control initiation timing for said catalyst;
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> executing a rich-burn control operation and generating an exhaust gas which is in a fuel-rich state, accompanying recirculation of EGR gas; and
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> activating a catalyst metal of said catalyst immediately before said rich-burn control operation is performed,
>
> wherein said catalyst includes a NO_x occluding substance that is transformed into nitrate as a result of occluding activities, which is then regenerated back to allow continuation of NO_x occlusion, and
>
> wherein said catalyst activation control operation executes a burning control operation in the condition of an EGR valve being totally closed, and at the same time, controlling the torque generation of the diesel engine by an intake control to reduce the torque variation during the transition from the normal control operation to the catalyst activation control operation.

Support for claim 13 can be found, for example in the published specification at Paras. [0008]-[0016]. Applicant submits that no new matter is being added in claim 13, that claim 13 is different from and not narrower then prior filed claims and that claim 13 distinguishes over the prior art.

CONCLUSION:

In accordance with the foregoing, Applicant respectfully submits that all outstanding objections and rejections have been overcome and/or rendered moot. And further, it is respectfully submitted that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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